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Impact assessment and coastal climate change adaptation in a local transdisciplinary perspective

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From an applied point of view, the authors present and discuss inter- and transdisciplinary approaches to assess and deal with natural coastal hazards and climate change impacts. The construction of a shared working platform for knowledge integration across levels of governance and between research, private and public institutions, and the local communities provides: understanding of the immediate and potential future challenges; appreciation of different stakeholder motives, business agendas, legislative constraints etc., and common focus on how to cost-efficiently adapt to and manage impacts of climate change. The platform is dynamically updated with additional data and knowledge, e.g. from climate change evidence, or, by provision of updated regional models of future sea level rise. In order to integrate natural hazards and impact development over time, models on hydrology, geology and groundwater (e.g. in relation to storm surges, precipitation, morphological change, and subsidence) are developed and applied to get information on floods, inundation and stow in storm sewers etc. (Sorensen et al 2016). In addition, information about buildings, infrastructure, the environment etc. is used to map vulnerability and risk, and strategies for community engagement and capacity-building are included. The initial bias towards the natural sciences, to a large extent dictated by technical stakeholder focus and data availability, is gradually balanced as especially economics and social sciences take a more prominent role. For example, the investment and maintenance costs of securing functional water and wastewater pipes are significantly reduced by incorporation of knowledge about climate change impacts. The presented approaches yield an integrative process-oriented framework to handle uncertainties and reach optimal adaptation, planning, and management solutions.

References:

Sorensen C, Broge NH, Molgaard MR, Schow CS, Thomsen P, Vognsen K and Knudsen P (2016). Assessing Future Flood Hazards for Adaptation Planning in a Northern European Coastal Community. *Front. Mar. Sci.* 3:69. doi: 10.3389/fmars.2016.00069